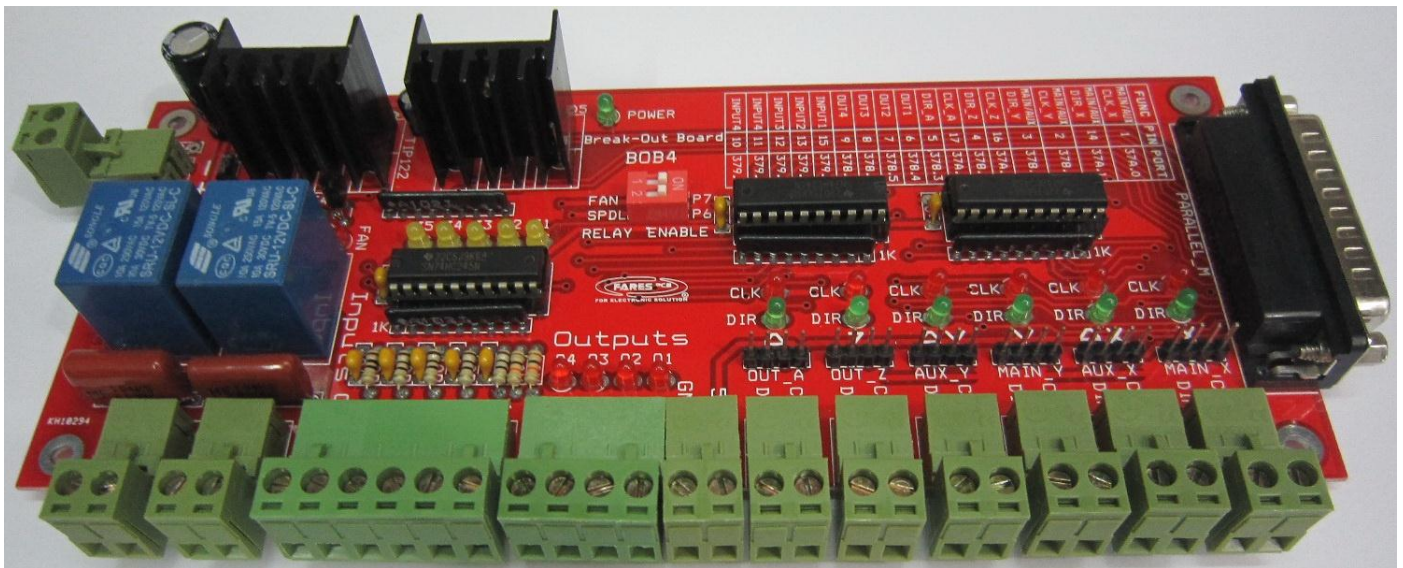


General Description

FIPBOB4 is a complete, buffered non-isolated parallel breakout board. It supports four output control signal groups to drive four axis CNC machine with extra two duplicated auxiliary output control signals for X and Y axes. Each signal group supports two control signals (Clock and Direction). All signals are standard TTL level (Logic high implemented by 5V and logic low implemented by 0V)

FIPBOB4 supports five standard limit switches. Two output relays could be enabled via DIP switch for additional spindle and fan control.

Figure 1. FIPBOB4



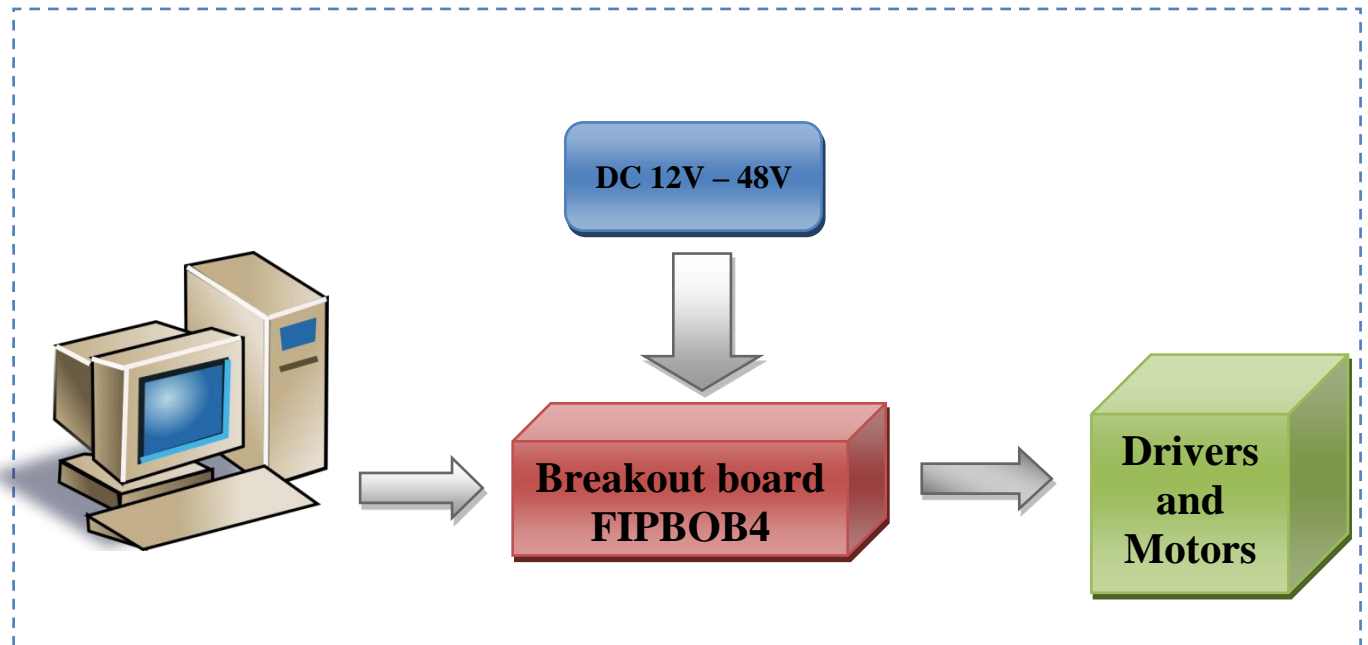
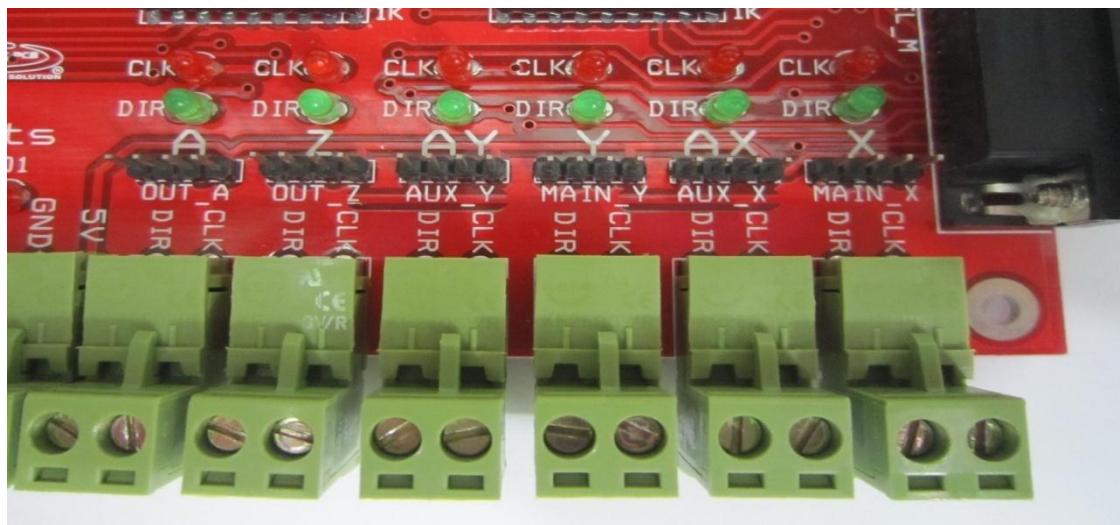
FIPBOB4 Features

- 12-48 DCV power input.
- Six output signal groups provide 4 axes control
 - Main X axis
 - Auxiliary X axis
 - Main Y axis
 - Auxiliary Y axis
 - Z axis
 - A axis
- Each control signal group consists of Clock "CLK" and Direction "DIR" outputs. Control signals are TTL compatible (-10mA). for pin assignment and addressing show table1.
- LED indicator for
 - Output clock signals "Red LED"
 - Output direction signals "Green LED"
 - General output signals "Red LED" for (O1, O2, O3, O4)
 - Output relays "Red LED" for (Spindle, Coolant)
 - Input signals" Yellow LED"
 - Power Supply "Green LED"
- Five external inputs (Dry contact) for standard micro switches.
- Two output relays 12V coil / 5A contacts (resistive load) for spindle and coolant control.
- All outputs are brought out via pin header and pluggable screw clamp connector.
- Dimension: 205 x 80 x 27 mm

Table1 shows each output and input port, its pin number on DB25 socket and its function. Use this table to configure the software that interface **FIPBOB4** card.

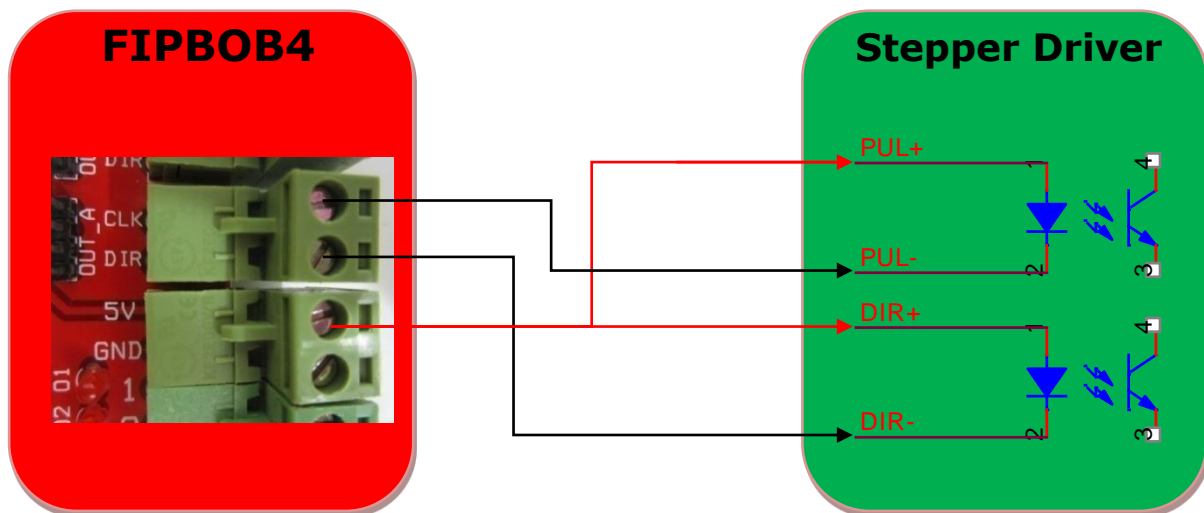
Table1. Input and Output Ports

Port #	Pin#	Function	Direction
378.0	2	Main CLK_Y Aux CLK_Y	Output
378.1	3	Main DIR_Y Aux DIR_Y	Output
378.2	4	DIR_Z	Output
378.3	5	DIR_A	Output
378.4	6	O1 / Spindle	Output
378.5	7	O2 / Coolant fan	Output
378.6	8	O3	Output
378.7	9	O4	Output
37A.0	1	Main CLK_X Aux CLK_X	Output
37A.1	14	Main DIR_X Aux DIR_X	Output
37A.2	16	CLK_Z	Output
37A.3	17	CLK_A	Output
379.3	15	IN1	Input
379.4	13	IN2	Input
379.5	12	IN3	Input
379.6	10	IN5	Input
379.7	11	IN4	Input

Figure 2. System Overview**Figure 3. Output axis connections**

How to connect control signals?

1. Connect "5V" power to all positive inputs of stepper driver.
2. Connect output "CLK" to negative input of "Pulse", "step" or "clock" labeled input in stepper driver.
3. Connect output "DIR" in **FIPBOB4** to Direction input in stepper driver.

Figure 4. A - Axis connection**A - Axis connection****Note:**

The output Main-X/Main-Y and Aux-X/Aux-Y are the same respectively. Use main and auxiliary outputs to control two motors driving the same axis.

How to connect spindle and coolant fan?

1. Enable Spindle and/or Fan by setting DIP switch as seen in figure 5.
2. Set the output pin 2 as Spindle and the output pin 3 as fan in software program.
3. The output is dry contact and rated for 3A max. So, if the load needs more current use external relay or contactor.

Figure 5. Spindle and coolant fan enabling

Set SW1 (COOL) to ON state
Set SW2 (SPNDL) to ON state

Port	Pin	Function
378.5	7	Coolant fan
378.4	6	Spindle

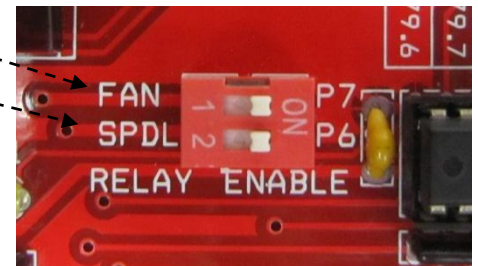
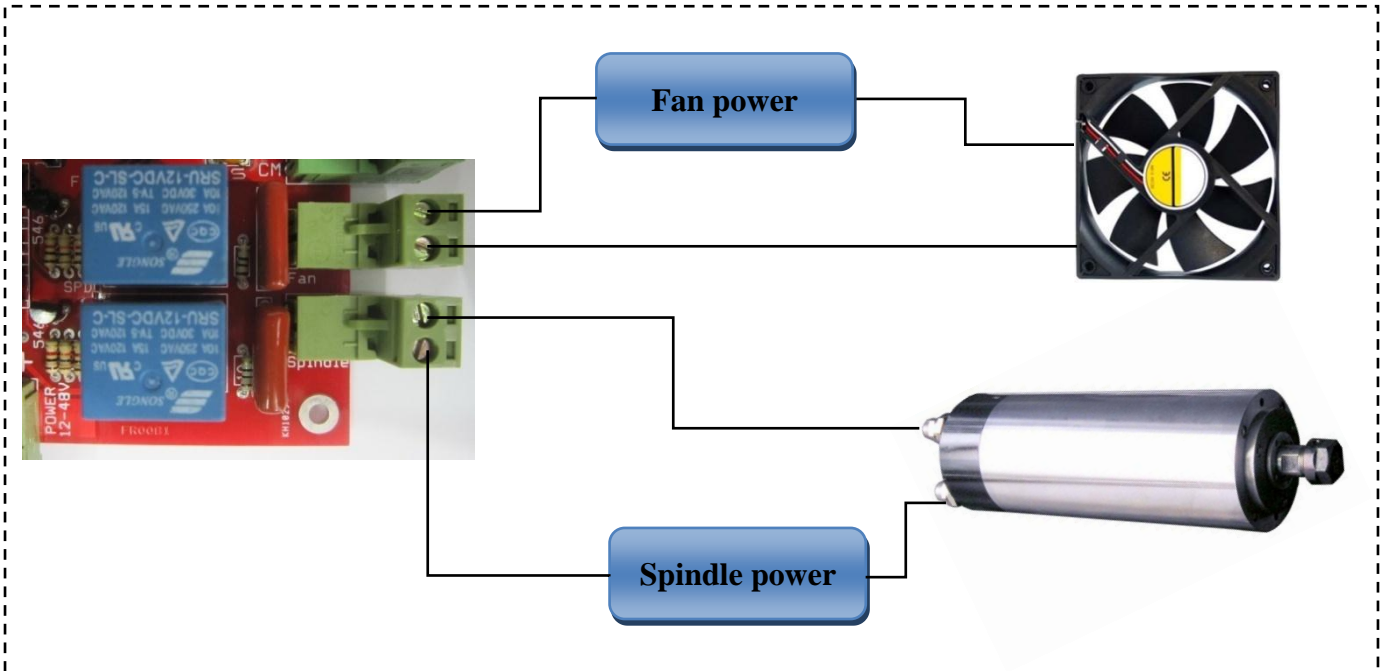


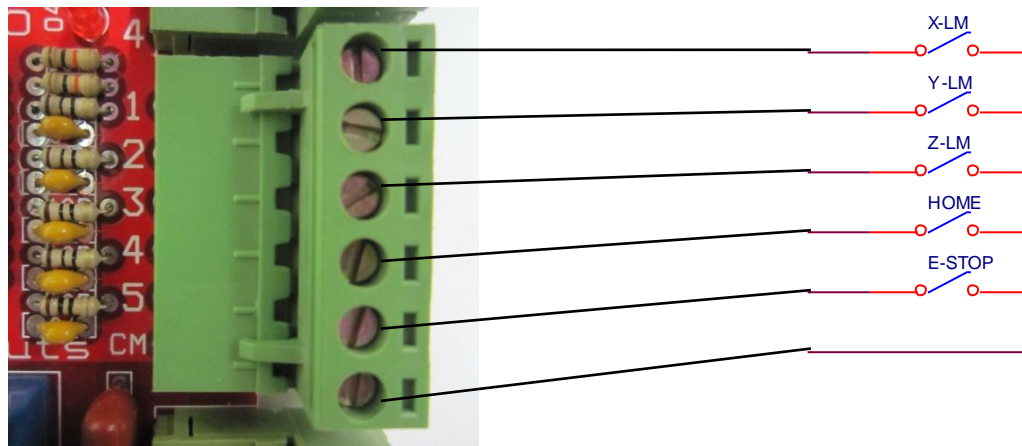
Figure 6. Connection of spindle motor and coolant fan to FIPBOB04



How to connect input limit switches?

1. Connect one terminal of each switch to an input on **FIPBOB4**
2. Collect all other terminals of limit switches and connect them to "CM" output terminal on **FIPBOB4**.

Figure 7. Connection of standard limit switches.



Port	Pin	Function
379.3	15	E-STOP
379.4	13	HOME
379.5	12	Z-LM
379.6	10	X-LM
379.7	11	Y-LM

This is just for explanation and not obligatory input signal distribution.

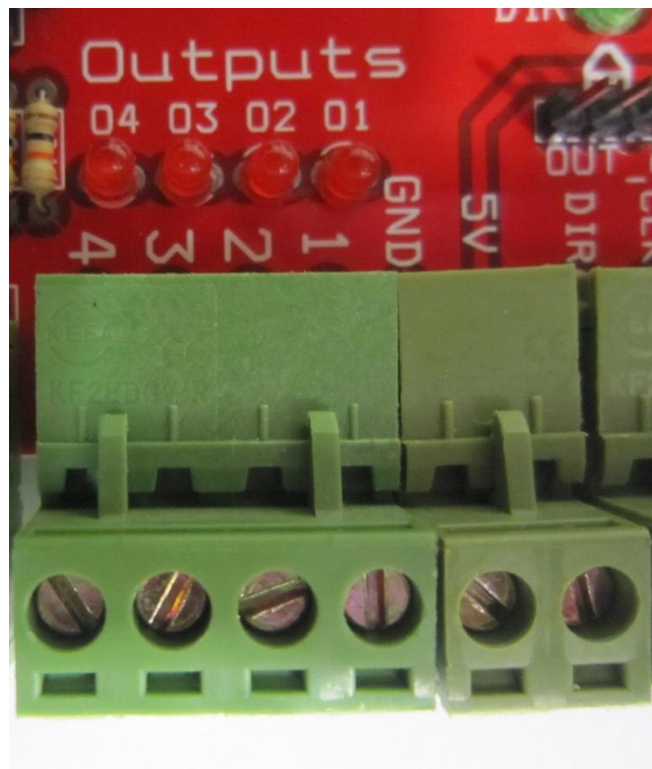
General Outputs.

There are four outputs labeled **O1**, **O2**, **O3** and **O4**. **O1**, **O2** share the same parallel port pins that driving Spindle and Fan respectively. The four outputs are general for any usage such as enable control signal for motor drivers. The specifications of general outputs are typical to any other axis output.

Figure 8. General outputs.

All signals are standard TTL level (Logic high implemented by 5V and logic low implemented by 0V). With LED indicator for each output. These outputs may be used for extending available axes up to 6 axes.

Port	Pin	Function
378.4	6	O1/Spindle
378.5	7	O2/Fan
378.6	8	O3
378.7	9	O4



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